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text and to the advertisements, all of which greatly increase its value as a reference book.

The aim of the editor is shown in the following extract from the preface:

> The intention in preparing this work has been to collect and put in convenient form all the reliable statistics of the world; to collect more promptly and more accurately than had hitherto been done the mineral statistics of the United States; and to photograph, as it were, the condition of the industry from year to year, bringing out into boldest relief that information which has the greatest practical value in the development of the industry and which is not easily accessible. . . . This work is above all things designed to be of actual value to the practitioner, to afford those engaged in mining, metallurgy, and industrial chemistry, a safe and authoritative guide which will keep them informed as to what is being done, and how it is done, in each department of the industry throughout the world.

T. C. H.

Honeycombed Limestones in Lake Huron. By ROBERT BELL.

In the Bulletin of the Geological Society of America, Dr. Robert Bell describes the honeycombed limestone of Lake Huron. It is found chiefly about Manitoulin Island, Indian Peninsula, and the area between these and Georgian Bay. The formation progresses faster in water fifty or sixty feet deep, but takes place in shallow water. It is found on the under side of overhanging rocks as well as on other surfaces. There are two principal forms of this erosion. In the first the cavities are elliptical, and neighboring ones tend to meet, giving a very spongy appearance. In the second the pits are finger like and crowded close together at the surface. They are usually shallow, but may be some inches in depth. The rocks in the vicinity of Manitoulin Island run from the Chazy to the Guelph. Dr. Bell finds the pits largest and most numerous in the dolomite of the Guelph formation. As to the immediate causes of the solution to which they are due, Dr. Bell cites an obscure concretionary structure in the rock, and an unusual amount of H_2SO_4 and sulphates in the water. He attributes the source of the sulphur compounds to the Huronian rocks that lie on the north of the lake. These are in part volcanics and rich in sulphides. He thinks solution is aided by hydrostatic pressure, free action of water and shifting currents.

Critical Periods in the History of the Earth. By JOSEPH L. LE CONTE.

The thesis laid down by the author is that "There must have been some greatest revolutions which have in some way directly or indirectly affected the whole earth, and which may therefore be used to form the basis of the primary divisions of time." These he calls "Critical Periods" in the earth's history. The marks of such periods are readjustments of the crust of the earth, causing widespread changes in physical geography, affecting profoundly the climate of the whole earth, and causing marked changes in organic forms. These are indicated in the rocks by (1) widespread unconformities; (2) great, general, and rather sudden changes in organic forms; (3) the introduction of new and higher dominant classes; (4) the birth of great mountain ranges. Of these periods, beginning with the last, he enumerates the following—the Glacial revolution, the post-Cretaceous or Rocky Mountain revolution, the post-Palæozoic or Appalachian revolution and the pre-Cambrian revolution.

Of these it may be said—(1) they become shorter and shorter as we progress in the earth's history; (2) the effect of the introduction of new dominant types in producing changes in the whole organic kingdom steadily increases; (3) the oscillations of temperature have gradually increased. These periods hasten the steps of evolution and increase organic diversity, but diminish geographical diversity. These revolutions seem to be contrary to uniformity in the forces and laws of nature, but they are not so in reality. We may conceive of phenomena as being under the influence of two opposite forces, one progressive, the other conservative. Such will be more or less paroxysmal. Resistance at first prevails, and there is little change, but forces of change are accumulating, and finally resistance gives way and conspicuous changes take place rapidly.

Teepee Buttes. By G. K. GILBERT and F. P. GULLIVER.

In the Bulletin of the Geological Society of America, Gilbert and Gulliver have some interesting things to say of the Teepee Buttes of Colorado. They are found in a belt about ten miles wide and fifty to sixty miles long, at least, beginning at Little Butte Station on the Denver & Rio Grande Railroad, and extending to the south and east along that railroad. They are not continuous but gravel areas separate areas dotted with them. They are twenty to thirty-five feet in height, rudely circular, and diameter is usually less than height. The structure is peculiar, viz., a core of coarse, light-gray limestone, bedded and full of marine fossils, surrounded by a shale which has few fossils